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10/516,702	12/02/2004	Andreas A Popp	29827/40663	6743
4743 7590 09/15/2009 MARSHALL, GERSTEIN & BORUN LLP 233 SOUTH WACKER DRIVE 6300 SEARS TOWER CHICAGO, IL 60606-6357			EXAMINER CHEUNG, WILLIAM K	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			09/15/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/516,702

Applicant(s)

POPP ET AL.

Examiner

WILLIAM K. CHEUNG

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/8/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4-7, 10-16, 18, 21-23, 27, 29, 30 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-7, 10-16, 18, 21-23, 27, 29, 30 and 32-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. In view of the following new issues, the instant application is reopened for prosecution. Claims 2, 3, 8, 9, 17, 19, 20, 24, 25, 28, 31 have been cancelled. Claims 1, 4-7, 10-16, 18, 21-23, 27, 29, 30, 32-34 are pending.

Claim Rejections - 35 USC § 103

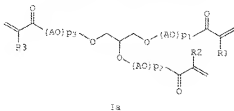
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

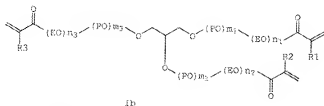
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1, 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al. (EP 0 777 287 A2) for the reasons adequately set forth from paragraph 5 of the office action of January 23, 2009.

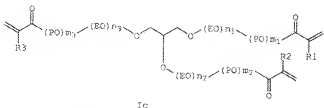
1. (Previously presented) An ester F of formula Ia



or formula Ib



or formula Ic



wherein AO is for each AO independently EO or PO.

EO is O-CH₂-CH₂-.

PO is at each instance independently O-C(CH₃)-CH(CH₃)- or O-CH(CH₃)-CH₂-.

a sum of m1 + m2 + m3 + n1 + n2 + n3 is 3, 4, or 5,

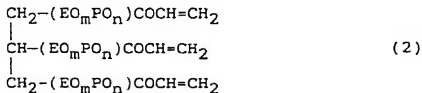
a sum of m1 + m2 + m3 is 1, 2, 3, or 4,

a sum of p1 + p2 + p3 is 3, 4, or 5, and

R1, R2, and R3 are independently H or CH₃.

wherein at least one AO is PO and at least one further AO is EO.

Matsui et al. (abstract) disclose formula (2), where m and n are greater or equal to zero, and m and n cannot be zero at the same time, that is fully encompassing the ester F as claimed.



The difference between Matsui et al. and the invention of claims 1, 4-6 is that although formula (2) of Matsui et al. teach the values of m and n to be greater or equal to zero, where m and n can not be zero at the same time, which lacks the specificity of the low p1, p2, p3, m1, m2, m3, n1, n2, n3 values as claimed.

However, applicants must recognize that the teachings of Matsui et al. primarily focus on the m+n having low values as shown in Table 1 of Matsui et al. (page 7). Additionally, Matsui et al. (abstract) clearly indicate that a MW of less than 500 per terminal group is preferred, which correspond to a n value of about less than 5.

Table 1

Number of ethylene oxide unit "n"	molecular weight/polymer group number	cycle life
2	186.7	210
4	274.7	238
6	362.7	247
8	450.7	226
10	538.7	112
Comparative example	-	103

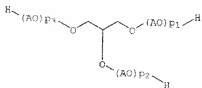
Therefore, since m and n values are explicitly taught to be low (a range from 0 to 10), it would have been obvious to one of ordinary skill in art to incorporate the low m and n values as taught in the table to obtain the invention of claims 1, 4-6, motivated by

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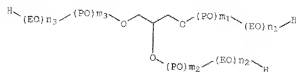
the expectation of success of obtaining a non-aqueous electrolyte secondary battery and to improve the interfacial characteristic between the electrolyte and the negative electrode.

4. Claims 7, 10-18, 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al. (EP 0 777 287 A2) in view of Barthold et al. (US 5,472,617) for the reasons adequately set forth from paragraph 6 of the office action of January 23, 2009.

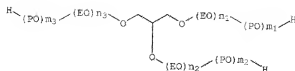
7. (Previously presented) A process for preparing an ester F of claim 1 from an alkoxylated glycerol of the formula IIa, IIb, or IIc



IIa



IIb



IIc

wherein AO, EO, PO, n1, n2, n3, m1, m2, m3, p1, p2, and p3 are each as defined in claim 1,

and (meth)acrylic acid, comprising the steps of

- a) reacting the alkoxylated glycerol with the (meth)acrylic acid in the presence of at least one esterification catalyst C, at least one polymerization inhibitor D, and optionally a water-azeotropic solvent E to form the ester F,
- b) optionally removing from the reaction mixture some or all of the water formed in a), during and/or after a),
- f) optionally neutralizing the reaction mixture.

h) when a solvent E is used, optionally removing the solvent E by distillation, and/or

i) stripping with an oxygen-containing gas which is inert under the reaction conditions, wherein

a molar excess of (meth)acrylic acid to alkoxyated glycerol is at least 3.15:1

and

the optionally neutralized (meth)acrylic acid present in the reaction mixture after the last process step substantially remains in the reaction mixture.

Set forth from paragraph 3 of instant office action, it would have been obvious to one of ordinary skill in art to obtain the compounds as claimed.

The difference between the invention of claims 7, 10-18, 21-23 and Matsui et al. is that Matsui et al. are silent on a process for preparing the compounds disclosed in Matsui et al.

However, Barthold et al. (col. 8, line 65 to col. 9, line 40; col. 9, Table 1; col. 11, Table 3) disclose a process for preparing the compound that is very similar to the glycerol based ester F as claimed. Regarding the claimed "stripping with a gas which is inert under the reaction conditions", since Barthold et al. col. 10, line 52 to col. 11, line 2) clearly disclose the stripping of water under a nitrogen atmosphere, the examiner has a reasonable basis that the claimed "stripping with a gas which is inert under the reaction conditions" has been met by Barthold et al. Motivated by the expectation of success of obtaining the compounds of Matsui et al., and in view of the substantially similar type of reactions, it would have been obvious to one of ordinary skill in art to incorporate the preparative method of Barthold et al. to prepare the compounds of Matsui et al. to obtain the invention of claims 7, 10-18, 21-23.

The difference between the invention of claims 7, 10-18, 21-23 and Matsui et al. is that Matsui et al. do not disclose minor variations of the process as claimed.

Nevertheless, Barthold et al. (col. 8, line 65 to col. 9, line 40; col. 9, Table 1; col. 11, Table 3) have clearly disclosed a process for preparing a compound that is similar to the glycerol based ester F as claimed. Therefore, the examiner believes that it would have been obvious to one of ordinary skill in art to use "routine experimentation" technique to optimize the process of Barthold et al. to obtain the invention of claims 11-13. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 14-16, Barthold et al. (col. 8, line 65 to col. 9, line 40; col. 9, Table 1; col. 11, Table 3) disclose a process for preparing the compound ester F as claimed. Further, Barthold et al. (col. 13, Table 4; col. 16-17, claim 1) clearly teach the copolymerization of the prepared compound with a methacrylic acid or acrylic acid. Barthold et al. contain all the limitations of claims 14-16. Motivated by the expectation of success of obtaining the compounds of Matsui et al., and in view of the substantially similar type of reactions, it would have been obvious to one of ordinary skill in art to incorporate the preparative method of Barthold et al. to prepare the compounds of Matsui et al.

5. Claims 26, 27, 29, 30, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al. (EP 0 777 287 A2) in view of Barthold et al. (US 5,472,617) for the reasons adequately set forth from paragraph 7 of the office action of January 23, 2009.

26. (Currently amended) A crosslinked hydrogel particle of claim 14 having a saponification index of less than 11.

Set forth from paragraph 3 of instant office action, it would have been obvious to one of ordinary skill in art to obtain the compounds as claimed. Regarding the claimed "crosslinked gel" feature, Matsui et al. (abstract) clearly disclose a gel electrolyte. In view of the substantially identical multifunctional compound as claimed and as disclosed in Matsui et al., the examiner has a reasonable basis to believe that the claimed "crosslinked" feature is inherently possessed in the compounds of Matsui et al.

The difference between the invention of claims 26, 27, 29, 30, 32-34 and Matsui et al. is that Matsui et al. do not disclose the level of saponification (or index) as claimed.

Barthold et al. (col. 8, line 65 to col. 9, line 40; col. 9, Table 1; col. 11, Table 3) disclose a process for preparing the compound ester F as claimed. Further, Barthold et al. (col. 13, Table 4; col. 16-17, claim 1) clearly teach the copolymerization of the prepared compound with a methacrylic acid or acrylic acid. Barthold et al.

Although the main teachings of Barthold et al. is prepared a resin as oil demulsifiers for the rapid dehydration of crude oil (col. 1, line 10-15), Barthold et al. (col. 1, line 52-62) teach that all these disclosed resin can be easily gelled. Since Barthold et al. (col. 18, claims 6, 10) disclose that the composition can comprise water ranging from 1 to 99 %, the examiner has a reasonable basis that the claimed "diluent" has been met by Barthold et al. Further, since the composition of Barthold et al. can be in the form of a

gel and contain water, the examiner has a reasonable basis that the claimed hydrogel feature has been met by Barthold et al.

Regarding the claimed saponification indexes, in view of the substantially identical composition of Barthod et al. and the composition as claimed, the examiner has a reasonable basis that the claimed saponification indexes are inherently possessed in Barthold et al. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Motivated by the expectation of success of obtaining the compounds of Matsui et al., and in view of the substantially similar type of reactions, it would have been obvious to one of ordinary skill in art to incorporate the saponification index teachings of Barthold et al. into Matsui et al. to obtain the invention as claimed.

Response to Argument

6. Applicant's arguments filed June 8, 2009 have been fully considered but they are not persuasive.

Regarding the rejection of Claims 1, 4-6 with Matsui et al. (EP 0 777 287 A2), applicants continue to argue that the broad range teachings in Matsui et al. do not have sufficient specificity to set forth a 103 rejection because applicants argue that Matsui et al. do not teach an upper limit for the sum of $m+n$ disclosed in Matsui et al. Therefore, applicants argue that there are infinite number of possibilities from the teachings of

Matsui et al. However, the examiner disagrees because every point disclosed in the range taught in Matsui et al. is adequate for a 103 rejection. Further, applicants fail to recognize that the teachings of Matsui et al. primarily focus on the $m+n$ having low values as can be indicated by the Table 1 of Matsui et al. (page 7). Therefore, since m and n values are explicitly taught to be low (a range from 0 to 10), the examiner has a reasonable basis to issue the new 103 rejection set forth.

Table 1

Number of ethylene oxide unit "n"	molecular weight/polymer group number	cycle life
2	186.7	210
4	274.7	238
6	362.7	247
8	450.7	226
10	538.7	112
Comparative example	-	103

Regarding applicants' argument that the teachings of Table 1 of Matsui et al. exclude propylene oxide, applicants must recognize that Table 1 of Matsui et al. evidently teach the preference of having n in the low value region. Although applicants argue that Table 1 fail to teach m preferably being low number, applicants fail to recognize that the Matsui et al. (abstract) clearly indicate that the molecular weight per terminal polymer functional group number is 500 or less, which further indicates that the sum of m and n are preferably to be a low number.

Applicants further argue that the claimed invention is not considered obvious in view of the unexpected results presented in the specification (page 51-52, Table 1 and 2). However, applicants must recognize that the comparative data are not commensurate to the scope of the claimed invention because the invention being claimed is much broader than the scope encompassed by comparative data. Therefore, the examiner has a reasonable basis to believe that the argued unexpected results fail to show the criticality of the claimed invention.

Regarding the rejection of Claims 7, 10, applicants argue that the stripping process as disclosed in Barthold et al. is different from the process as taught in applicants' specification (page 22, lines 14-20; page 21, line 24 to page 22, line 12). However, applicants must recognize that although the claims are interpreted in light of the specification, the specification can not be read into the claims. Therefore, applicants' argument relating to the stripping step is not supported by the claims as written. Regarding applicants' argument that the specification indicates that the oxygen containing gas contains a compound like MEHQ, the argument is not supported by the claims as written. Regarding applicants' argument that Barthold et al. do not teach the molar excess ratio as claimed, applicants must recognize that formulas(1-4) (Barthold et al., abstract) having at least three terminal groups clearly indicate the stoichiometric molar ratio being claimed.

Regarding applicants' argument that the blanketing with an oxygen containing gas of Barthold et al. does not equate to stripping, applicants fail to recognize that blanking or stripping, both require an oxygen containing gas to be passed through the

reactants, which can carries some of the reaction contents in the process. Therefore, the examiner has a reasonable basis to maintain that blanketing and stripping are functionally equivalent in the teachings of Barthold et al. Regarding the claimed "oxygen containing" feature, applicants must recognize that the volatiles within the reaction mixture contain oxygen. Since claim 7 does not require the oxygen containing gas to be oxygen (O_2), applicants do not have any basis to argue the inhibitory effect of O_2 with MEHQ in a polymerization process. Therefore, the rejection set forth is proper.

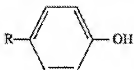
Regarding applicants' argument that Barthold et al. fail to teach the claimed molar excess of methacrylic acid to alkoxyated glycol of at least 3.15:1 because Barthold et al. (col. 4, line 63 to col. 5, line 1) only teach a molar ratio of 1:1, the examiner disagrees. Applicants fail to recognize that Barthold et al. (col. 5, line 13-16) clearly disclose the ratio as claimed. Applicants fail to recognize that Barthold et al. clearly teach the molar ratio of methacrylic acid to oxyalkylated alcohol to range from n:1 to 1:1, where n is the number of hydroxyl groups of the starting alcohol. For example, for formula (3) of Barthold et al. (abstract), the functionality would be 6. A molar ratio of 6:1 definitely meets the claimed "at least 3.15:1" feature of claim 7.

65 In order to prevent polymerization during the esterification, it is advisable to use stabilizers which are known per se (preferably hydroquinone monomethyl ether). The ratio of the oxyalkylated alcohol to acrylic acid or methacrylic acid may be varied from 1:1 to 1:n, where n is the functionality (i.e. the number of hydroxyl groups) of the starting alcohol. A ratio of 1:1 is preferred, since otherwise gelling may be

observed during the subsequent polymerization. Complete esterification of the acrylic acid or methacrylic acid is advantageously monitored by analytical methods (eg. the acid number). The amount of stabilizer varies from 0.3 to 2% by weight and is preferably 1% by weight, the percentages being based on the amount of acrylic acid or methacrylic acid. The acid catalyst is added in an amount from 0.5 to 5, preferably from 2 to 3%, by weight. Equally good esterification results are obtained by using acrylic anhydride or methacrylic anhydride and acryloyl chloride or methacryloyl chloride. In this procedure, removal of the water by azeotropic distillation is dispensed with.

Regarding applicants' argument that a preferred ratio of 1:1 is preferred in Barthold et al., applicants fail to recognize that the non-preferable embodiment, Barthold et al. (col. 3, line 50-52) clearly disclose that n can be as 3, 5 or higher, in view of the explicit teachings of oxyalkylated alcohol prepared from trimethylpropane (n=3), pentaerythritol (n=5), sorbitol, polyglycerol. Therefore, the examiner has reasonable basis to maintain the rejection set forth.

The oxyalkylated alcohols are prepared in a conventional manner by reacting the monofunctional or multifunctional alcohol with an alkoxide or a mixture of several alkoxides or blocks of several alkoxides, using a basic catalyst at from 80° to 160° C. Examples of suitable alcohols are ethanol, butanol, isopropanol, tallow fatty alcohol, stearyl alcohol, alkylphenols of the general formula



where R is, for example, C_6H_{13} , CH_3 , $CH(CH_3)_2$, $C(CH_3)_3$ or C_8H_{17} , ethylene glycol, propylene glycol, bisphenol A, glycerol, trimethylolpropane, pentacrythritol, sorbitol, polyglycerol or the alkylphenol/formaldehyde or acetaldehyde condensates described below.

Regarding applicants' argument that claims 11-13 under 35 U.S.C. 103(a) as being unpatentable over Barthold et al. (US 5,472,617), applicants (starting from page 24 of the brief) argue that the examiner fails to consider the teachings of Barthold et al. as a whole when considering the "routine experimentation" rationale set forth. However, applicants fail to recognize that the examiner fails to recognize that rationale set forth for the rejection for claims 7, 10 also applied to the rejection of claims 11-13.

Regarding applicants' argument that why would a person skilled in art strip a solvent from a reaction of the entire time of the reaction proceeding, applicants fail to recognize that stripping of a solvent from a reaction in Barthold et al. is unintentional. Rather, the stripping procedure in Barthold et al. is a result of the step of blanketing a

reaction. Although the intentions may be different when comparing Barthold et al. when comparing to the invention as claimed, however, the end results are still stripping.

Regarding applicants' argument that the recited "oxygen-containing gas" means a gas containing O₂ according to the specification (page 22, line 34-35), applicants must recognize that recitation fails to limit oxygen compound to be O₂ gas. Applicants must also recognize that the recitation also include water as an oxygen containing compound.

Regarding the rejection of claims 14-16, 26, 27, 29, 30, 32-34 as being obvious in view of Barthold et al., applicants argue that Barthold et al. fail to disclose a crosslinked hydrogel having a saponification index of less than 11 (claim 26), less than 8 (claim 32), or less than 5 (claim 33). Applicants also argue that Barthold et al. fail to disclose a crosslinked hydrogel having a reduced crosslinker content of less than 10 ppm (claim 27) or less than 5 ppm (claim 34). However, such minor variation is considered obvious in view of the teachings of Matsui et al. and Barthold et al.

Regarding applicants' argument that the use of "routine experimentation" rationale for the rejection of claims 11-13 is not proper since it is only a conclusionary statement, the examiner disagrees because Barthold et al. have already disclose substantially identical composition and process as claimed, the examiner has a reasonable basis to believe that the properties of claims 11-13 are inherently possess in the materials of Barthold et al. Even if it is not taught, it is within the skill of one of ordinary skill in art to optimize that process taught to obtain the invention of claims 11-13.

Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William K Cheung/
Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.
Primary Examiner
September 11, 2009